human race may be definitely improved by proper breeding,—as definitely improved as the breeds of domestic animals have been. Unless scientific principles come to influence marriage selection, human progress will cease.

Chapter II discusses the scientific method whereby our progress is now being made in the study of heredity, and the application of this method and its results to human breeding.

In Chapter III a great mass of material relating to the inheritance of family traits is brought together. It is shown that many qualities are inherited in accordance with the Meudelian expectation. Among these are color of eyes and hair; stature; musical, artistic, literary ability; mechanical skill; memory; temperament; mental ability; insanity; criminality; many defects of body and mind leading to disease; and numerous other personal characteristics.

Chapters IV and V deal with the Geographic Distribution of Inheritable Traits as determined by barriers, migrations, etc.

Chapters VI and VII deal with concrete American instances in which individuals with marked personal characteristics have impressed in special degree the lines of descent springing from them; and instances of marked family traits which persist for generations.

In Chapter VIII the author discusses the relation of Eugenics to Euthenics,—of the heredity influences to the environmental influences in molding the future of the human race. This is a very suggestive chapter and should be appreciated by all social workers.

The concluding chapter has to do with the relation of organized society to the matter of Eugenics, both as to the studies which must be prosecuted and to the application of the result in social control.

A good bibliography and index add to the usefulness of the book.

Heredity in Relation to Eugenics, by Charles B. Davenport. Illustrated; 298 pages. Henry Holt & Co., New York. Price, $2.00; by mail, $2.17.

HEREDITY AND EUGENICS

This book is a composite product of several men who, among Americans, are the leaders in the recent experimental study of heredity. It contains a somewhat popularized summary of the re-

cent advances of our knowledge of variation in plants and animals, of inheritance, and of evolution. It is entirely authoritative, and brings to the general student a dependable digest of the best conclusions in this department of investigation. This digest is similar to the summaries which are being given from time to time, in the *Transactions,* of the various special fields of biological research.

The chapters were originally given as lectures during the summer quarter of 1911 at the University of Chicago. The lectures quite naturally overlap to a certain extent.

Professor Coulter introduces the subject in a lucid way with two general lectures:—Recent Developments in Heredity and Evolution, and The Physical Basis of Heredity and Evolution from the Cytological Standpoint.

Professor Castle offers two chapters on The Matter of Evolution, and Heredity and Sex. In these chapters the general outline of Mendelism is given and its relation to other methods of evolution suggested, especially in the animal kingdom.

In Professor East's chapters the application of Mendelism is made to plant inheritance and breeding. The chapters are entitled:—Inheritance in Higher Plants, and Application of Biological Principles to Plant Breeding.

In Chapter VII, Professor Tower discussed the possibility of modifying the nature of the reproductive material of organisms by experimental processes, in such a way as to change inheritance from the outside. Professor Tower by no means confines his discussion to his own remarkable work on the chrysomelid beetles; but this work gives him added authority to discuss that of other people and is the backbone of his contribution. This part of the book has been less exploited elsewhere than the matter in the other chapters, and will prove somewhat more difficult to the general reader.

In the concluding lectures Dr. Davenport makes the application of the laws of organic heredity to man. The titles of Chapters VIII and IX are:—The Inheritance of Physical and Mental Traits of Man and Their Application to Eugenics; and The

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Heredity and Eugenics, by Castle, Coulter, Davenport, East, and Tower. University of Chicago Press, 1912. 315 pages, illustrated. Price, $2.50; by mail, $2.70.

Geography of Man in Relation to Eugenics. These chapters are drawn largely from Dr. Davenport's book reviewed above.

THREAD ATTACHMENTS BETWEEN NUCLEAR AND CYTOPLASMIC BODIES

I have read with much interest Mr. E. W. Roberts' article, "The Modern Theory of the Cell as a Complex of Organized Units," in *Transactions* of April, 1912.

Being an ardent worker in Cytology and having spent some years in trying to unravel a few of the many existing cytological problems, I was particularly attracted by some of the remarks and views advanced by Mr. Roberts in his highly attractive and interesting contribution.

Although many of Mr. Roberts' remarks appear at present of a very speculative character, and will require, possibly, many years of close microscopical work before they can either be proved or disproved; yet to me whilst reading them they have a charm of their likely possibilities.

Work in connection with a subject such as this presents great difficulties, both concerning the microscopical as well as the chemical character of the cell.

I was not aware of the fact until I read this paper that the cells of *Spirogyra* during life contained connecting filaments between each pyrenoid body and the nucleus; although I have examined *Spirogyra* many times in connection with various cytological work; this only proves to me how easily most important structure may evade the careful searchings of, I think I may say without egotism, a trained eye.

Apart from perhaps another point of interest in this cytological contribution the finding of the presence of these connecting filaments, *if beyond doubt,* is a wonderful achievement and a splendid addition to present knowledge of the complexity of the cell. I think Mr. Roberts is quite correct in his statement, that the question whether these connecting threads exist between the vegetative and nuclear groups of other types of cells is a field that has been entirely untouched up to the present.

Seriously considering the value of further development in this line of research, I felt myself irresistibly compelled to make investigations in this direction.